

# Safety Topic of the Month

## March 2008

RI-9900

Release of Operating Equipment for  
Mechanical Work

“Lock-out Tag-out, LOTO”

March 2008

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# RI-9900 Review

The goals for this Safety Topic are to:

- Review the Contra Costa County Safety Summit Basic Principals of Lockout/Tagout
- Highlight some of the primary elements of our Lockout Tagout process.
- O&M crews to hold a group discussion to identify what requirements of RI-9900 are typically done well, and those that are the most challenging
- Provide written feedback to suggest changes or written clarifications to RI-9900 to help improve implementation in the future.

# The Safety Summit

- The Contra Costa County Safety Summit process was initiated in 2001. The Safety Summit includes local business managers representing industrial facilities covered by the California Accidental Release Prevention (Cal-ARP) program, union leaders, and representatives of Contra Costa County Health Services and Cal-OSHA. The mission of the Safety Summit is to promote continual and effective collaboration about best industrial work processes.
- The first Safety Summit focused on sharing each facility's Lockout/Tagout (LOTO) process. It was found that implementation of LOTO varied widely among the facilities, so a team was formed to share the details of each company's LOTO procedure and develop a list of common principles that should be implemented by all. The next two slides list the Basic Principles of LOTO that were recommended by that team and supported by each refinery manager.
- The Richmond Refinery elected to incorporate the Safety Summit LOTO recommendations into RI-9900 in 2003 and since that time the Richmond's LOTO process has been largely adopted by several of the other Chevron refineries.

# Principals of LOTO

## BASIC PRINCIPLES OF LOCK-OUT/ TAG-OUT

- **Application.** All sources of hazardous energy should be treated with equal respect and application of procedures, i.e. electric, hydraulic, pneumatic, chemical, thermal, etc.
- **Operator tags and locks.** Operators who take equipment out of service and isolate it for mechanical work must tag and lock all isolation control devices.
- **Mechanic Locks.** Each individual mechanic that works on a piece of equipment must install a personal lock on either the controls used for isolation or on a lockout clip, "lock box", or similar lock-out device used to contain the keys to the isolation locks.
- **Major Turnarounds.** During major turnarounds when plant boundary blinds are installed, equipment internal to the plant that is protected by the boundary blind(s) does not need additional lock out. Information or blind tags hung at local isolation points are sufficient.
- **Electrical Isolation**
  - The Electrical Isolation Device (circuit breaker, disconnect switch, fuses, etc.) will physically be set to the electrically open position, then locked in that position. This function will only be performed by a trained and qualified person.
  - Locking or blocking of the equipment Start/Stop switch is not sufficient for isolation. Locking out the on/off switch may be the only option for low voltage lighting circuits, or low voltage equipment that does not use a dedicated electrical isolation device.
  - After the electrical isolation device is set and locked in the open position, the Start switch will be tested to verify the equipment will not start.
  - Local Start/Stop switches **should not be locked.** This is to allow verification of isolation. Verification should never be performed with the STOP or OFF switch held in the off position.
  - All Start/Stop switches associated with the equipment must be tagged and tested prior to commencing mechanical work.
  - The above process will be followed for each piece of equipment, including during major turnaround periods when an entire electrical bus or substation may be de-energized.

# Principals of LOTO

- **Written Isolation Lists** should be used to identify all isolation points (blinds, Double Block & Bleed, instrumentation leads, utility connections, etc.) Use of a diagram is suggested.
- **Verification – “Try-out”.** In addition to the above applicable procedures, isolation, depressurization and adequate clean-up of the system must be positively verified prior to commencing mechanical work. It is Operations responsibility to **demonstrate** to the mechanic’s satisfaction that equipment is in a safe condition. This may require observing the start of mechanical work or physically marking the equipment to ensure the correct system is being opened and/or repaired.
- **Standard Method of Isolation**
  - Use of Blinds or the Double Block and Bleed method is considered the standard for isolation of piping systems.
  - Approval of use of Single Block and Bleed method for isolation of specific equipment may be written into plant procedures.
  - In certain circumstances, work against a single block valve may be appropriate if a Job Hazard Analysis determines that the total risk of the job is not increased over using Blinds or DB&B. The written JHA must involve worker representatives and be approved by local management.
- **Contractors.**
  - Contractors must use the host employer’s LO/TO process, unless the contractor is working in a segregated “green field” area, and work is completely separate from existing, operating facilities.
  - Through auditing or other means, the host employer must ensure that contractors are trained on and thoroughly understand and follow the host employer’s LO/TO process.
- **Deviations.** Deviations from standard LO/TO procedures must be addressed through the facility Management Of Change or variance process. This includes instances when the equipment cannot be properly drained or depressured prior to opening. A written Job Hazard Analysis must be performed and then approved by local management.

# RI-9900 Highlights

- **Isolation.** All forms of hazardous energy must be isolated; electrical, hydraulic, pneumatic, mechanical, etc. Block or tie off machinery such as compressors or fin-fans blades that may inadvertently move during the job.
- **Locks.**
  - The responsible plant Operator will lock each isolation point with an isolation lock, place the isolation lock key in the lockbox and lock the lockbox with an operator lock.
  - The first craft Mechanic to work on the job will place a craft lock on the lockbox latch.
  - Unless using a group LOTO system and approved by the area Section Head and Impact Team, each mechanic will place his/her personal lock on the lockbox whenever they are actively working the job.
- **Tags.** Every lock must have a corresponding tag that is completely and legibly filled out in order to comply with Federal OSHA LOTO standards.
- **Isolation Lists.** Isolation lists are prepared by the Operator and reviewed by the Head Operator (or Impact equivalent). The list must be updated if the job scope or isolation location(s) change.

# RI-9900 Highlights

- **Bleeder valves.** All open bleeder valves must be tagged with an Open Bleeder tag. Bleeder valves should not be locked (RI-9900 will be updated to reflect this.)
- **Joint Jobsite Visit (JJSV).** The operator will demonstrate the proper isolation of the equipment to the mechanic(s) in the field prior to releasing the equipment for work.
- **Test.** On jobs involving an electrical isolation, the Start switch should be tested by the mechanic prior to starting work to ensure the equipment will not start.
- **Field Acceptance.** Upon completion of the work, mechanics will conduct proper housekeeping of the jobsite. The responsible plant operator will inspect the jobsite prior to signing off the work order as complete.
- **Deviations.** A MOC or Deviation Request Form must be completed prior to isolating equipment and conducting work inconsistent with the RI-9900 procedure.

# Crew Discussion

- Document attendance and discussion of this safety meeting.
- Consider any incidents or near-misses that have occurred as a result of improper equipment release, lack of following proper procedures or other LOTO issues.
  - 18 Plant P1820/1820A incident of August 2006 for example.
- Consider what is typically done well and what aspects of RI-9900 implementation could be done more consistently.
- Provide written feedback to Mark Robinson at RMAW or TC-339, regarding any concerns about improving implementation or providing clarification in procedures in the next update of RI-9900.